Art Nouveau Circa 1890-1910

1888 Heinrich Hertz Proves Electromagnetic Waves Exist

1890s Marconi's Wireless Telegraph

1900s Amateur Radio is Born

World War I ends Amateur Radio

The "APRS of Things"

Bryan Hoyer K7UDR

MicroHAMs 2018

NW Digital Radio

Sheeva Plug
2009 $99

NW Digital Radio

NW Digital Radio SBC
2011 $50

Raspberry Pi
2012 $35

NW Digital Radio
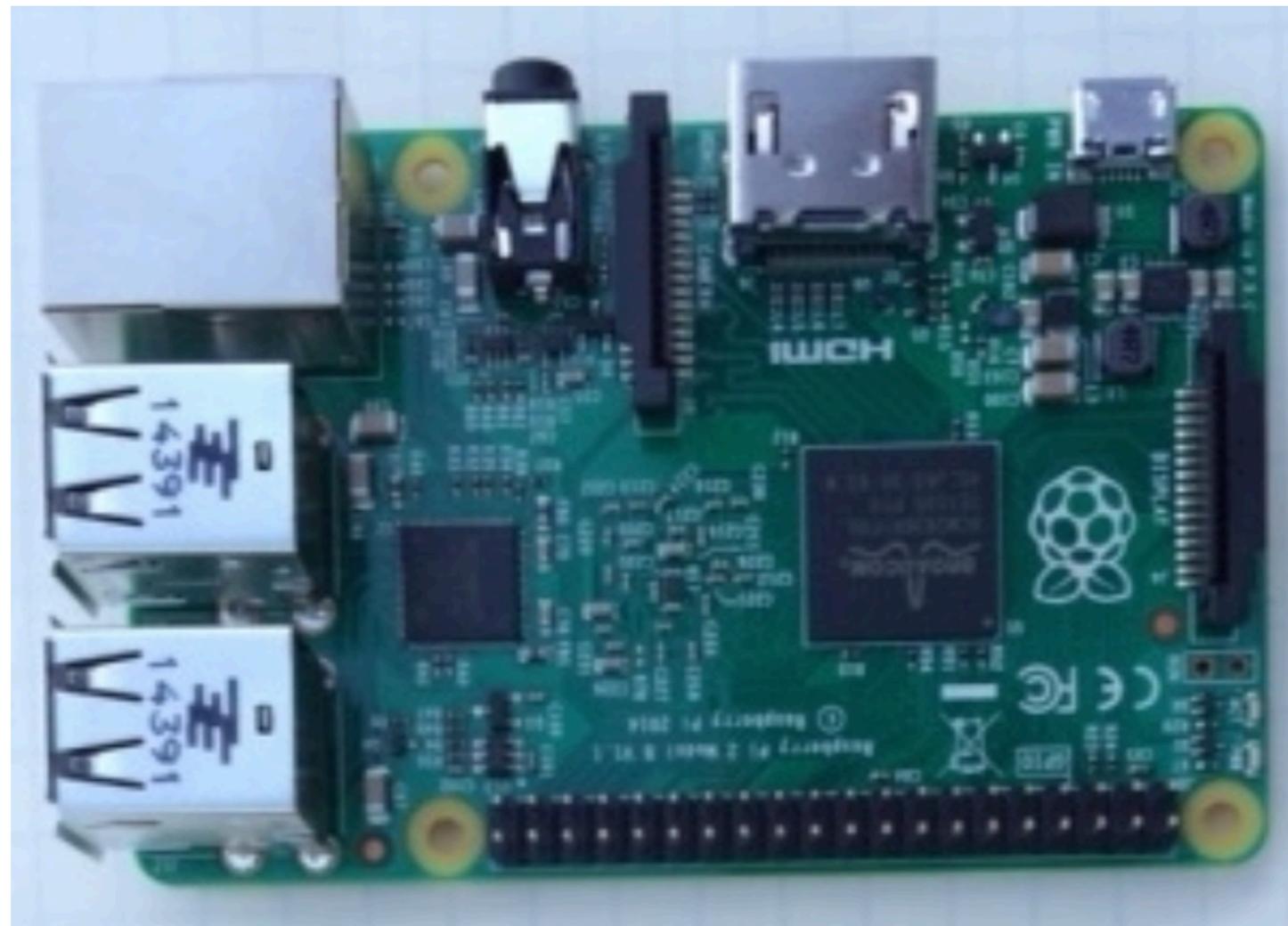
UDR SBC vs Raspberry Pi2

NW Digital Radio
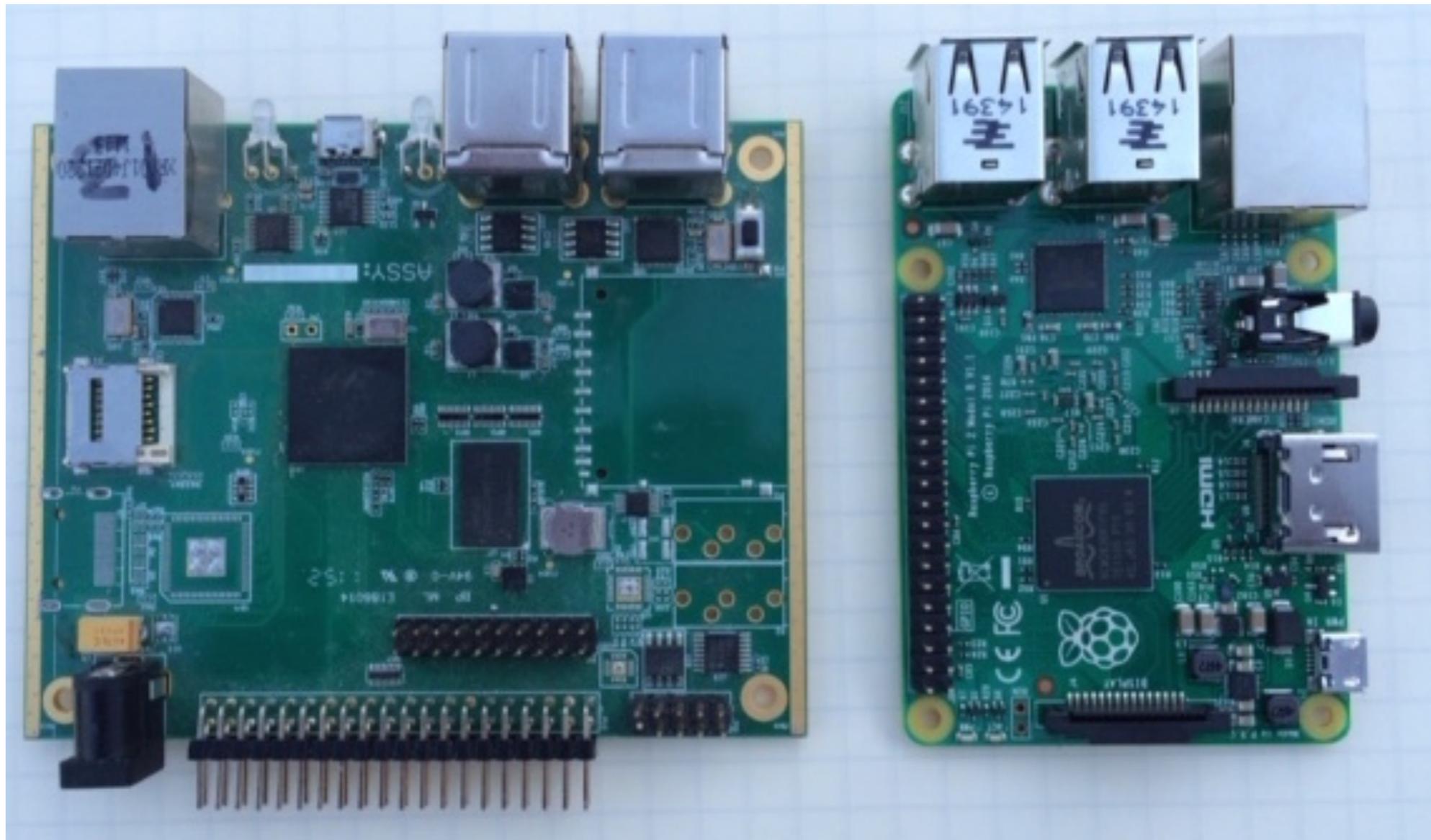
UDRC-II
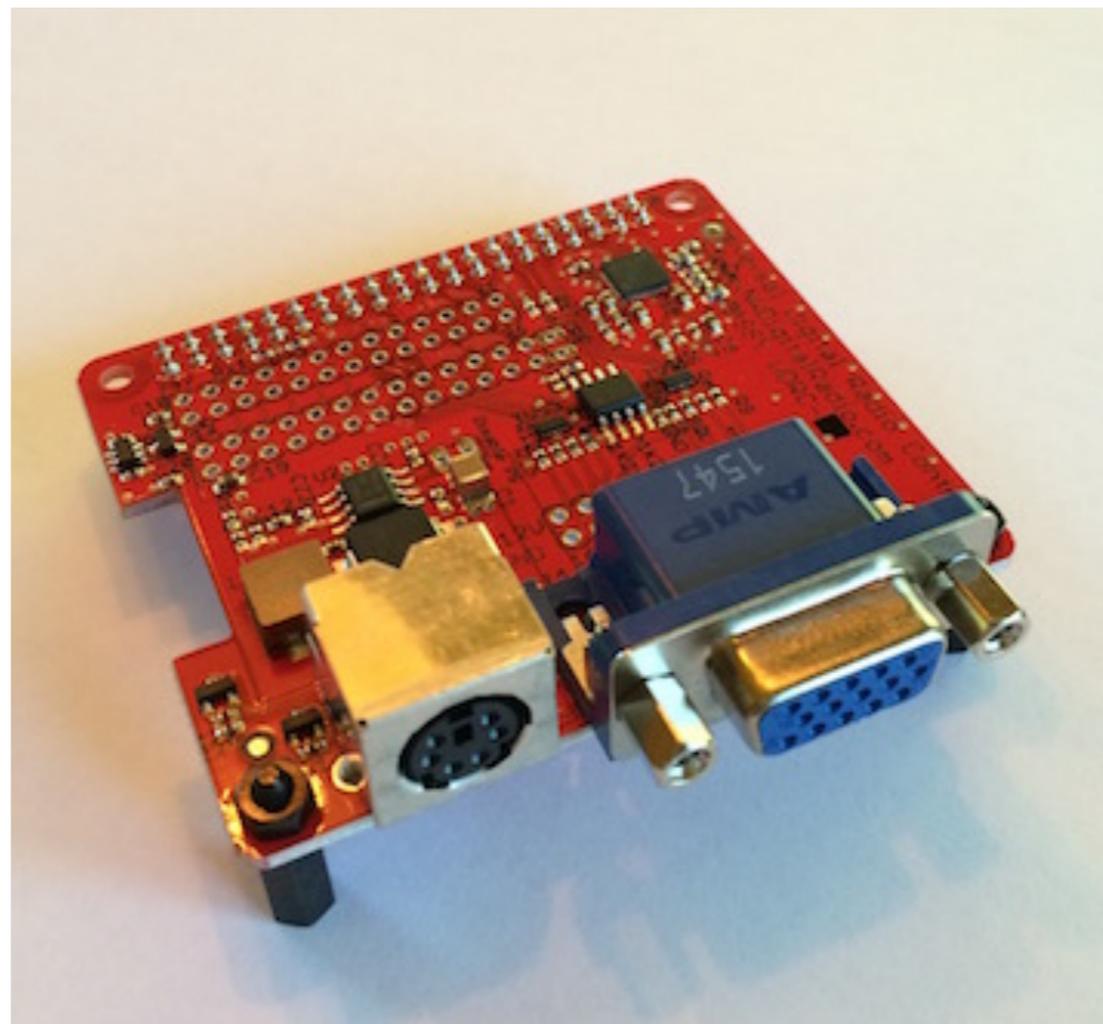
UDRC at a Glance

- Provides "4 Wire Interface for 2 Radios

- Raspberry Pi HAT Compliant (Pi 2 or 3)

- 12V to 5V Buck Regulator

  - 3A at 5VDC Back Powers Pi

- Sound Card Interface

- PTT via GPIO

NW Digital Radio

Why Amateur Radio?

- Can't we do everything with WiFi?

- Rural location without Internet

- Remote location Internet too expensive

- What about when Internet goes down?

- Hey, it's Amateur Radio

NW Digital Radio

Stuart Island Cabin

Generator Monitoring

- Stuart Island - off the grid slow Internet

- Generator runs 2Hrs twice weekly

  - Bad if it doesn't run worse if it doesn't stop

- UDRC to 2m rig to DIGI to IGate

  - To email and SMS

NW Digital Radio

Catherine Creek

- KK4SOA Brett Hoyer

- Creek level Monitor

- Uses One Watt Spot

  - Pi HAT w 1W RF XCVR

- Frequency Agile

NW Digital Radio

A Hailing Frequency for Packet Radio DCC 2012

- Control Channel / QSY for Traffic

  - Trunk Radio, Marine VHF, HF Nets

- Require Frequency Agile Radios

  - IW Spot

  - Rig Control HF Rigs AKA IC-706

NW Digital Radio

Aircraft Pre-Heat

- Uses Telecommand to turn on Pre-Heater

- DTMK Authenticated Messageing

NW Digital Radio

Authenticated Messaging MicroHAMS 2012

- Messages are Sent In The Clear

  - Your message here\SnH&87c

- Time based to prevent replay attacks

  - Requires TX/RX Clock < 1 Minute

- Works with Public or Private keys

- Andrew Pavlin, KA2DDO, YAAC

NW Digital Radio

TWEET-Gate

- Gateway between 2m APRS Messages and
  - 30m HF Messages
  - Selectively Gated using Authentication
- Why?
  - 30m is pretty good everywhere always
- POE UDRC, SDR-DONGLE, QRP 30m

NW Digital Radio

NW Digital Radio

- Questions?

- Comments

NW Digital Radio

NW Digital Radio XC-3006

- Transcoding between incompatible DV
  - D-STAR, DMR, System Fusion
- HW/SW XLX team in Europe
- Initial build by NW Digital Radio
  - 39 units due in April

NW Digital Radio

NW Digital Radio UDRC

- UDRC becomes netTNC

  - 2 Mini DIN6 Connectors

  - Packaged w/Pi3 in Aluminum Case

    - SW Preloaded and Configured

  - Built-in GPS w PPS and LNA/Antenna

  - Operates locally or headless

NW Digital Radio

Digital Radio Amateur Workstation

- What do we really want?

  - Local Control

  - Automated Operation

  - Couch Control

NW Digital Radio

DRAWS

- netTNC

  - KVM

  - Rig Control USB CI-V

  - WiFi

NW Digital Radio

NW Digital Radio 1W-Spot

- Based on netTNC

- 1W Transceiver on Board

  - Improved performance new Module
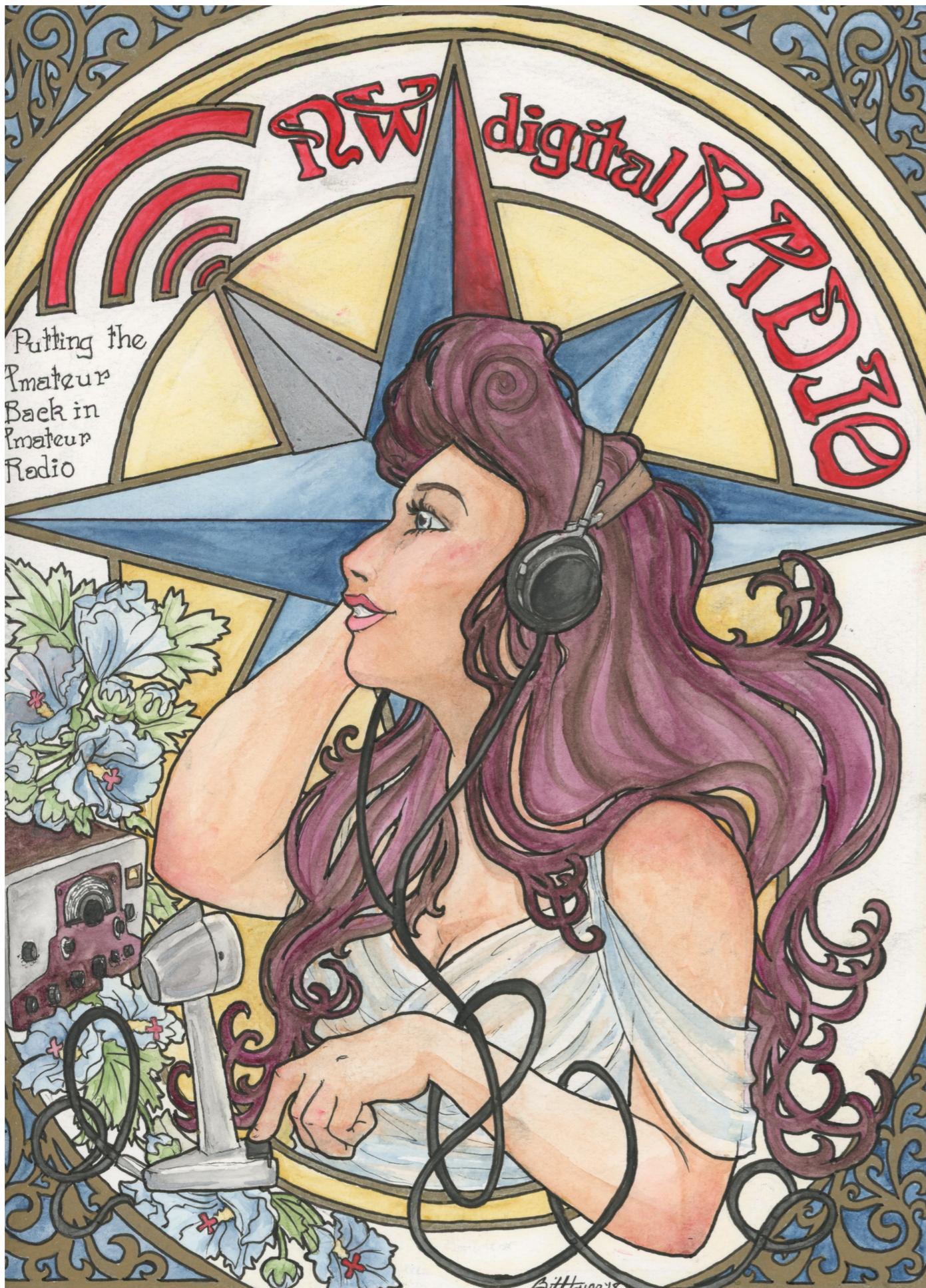
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It's about the Community

- Amateurs who are willing to Experiment

- Inexpensive Linux SBC

- Standard HW Interface

- Open-Source SW

NW Digital Radio

And the SW

- Direwolf

- JT*

- FLDIGI

- SVX-Link, Allstarlink

- WinDV, BlueDV, XLXLink, Buster

- Paclink-UNIX

NW Digital Radio

So Where do we go Now

- Things I'd like to see:

  - Packet Redux

    - Use QPSK with FEC and Gold Codes

    - IPV6

- But it's not compatible!

  - Who Cares if we all have access!

NW Digital Radio